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1 June 1979

TRANSLATIONS ON USSR MILITARY AFFAIRS  
(FOUO 14/79)

USSR

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COMMENTS ON U.S. AIR FORCE RESERVE COMPONENTS TRAINING

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 79 signed to press 8 Jan 79 pp 53-58

[Article by Maj V. Lyakhov: "Combat Readiness of U.S. Air Force Reserve Components"; passages enclosed in slantlines printed in boldface]

[Excerpts] Along with increasing the combat power of its regular units and subunits, the command of the U.S. Air Force is constantly increasing the combat readiness of its reserve components--the Air Forces of the National Guard and the command of the Air Force Reserve. All measures in this field are being conducted in accordance with the "single force" concept which has been adopted by the Pentagon, the essence of which consists of the use of regular forces and reserves as a single whole for the accomplishment of missions faced by the armed forces and, in particular, those facing the Air Force. The basic goal of these measures, which include the reequipping of the units and subunits of the organized reserve with contemporary combat equipment and weapons, the improvement of their organizational structure, the intensification of combat training, and so forth, is to raise the combat readiness of the reserve components to the level of the Regular Air Force.

According to data published recently in the foreign press, the Air National Guard and the Air Force reserve command now contain 294,000 people, of them 136,000 in the organized reserve, and there are also about 2,000 airplanes.

According to the words of the commander of the U.S. Air Force TAC [Tactical Air Command], General Dixon, the combat readiness of the organized reserve is now determined in accordance with the same criteria and standards as for the Regular Air Force. About 90 percent of the units and subunits of the Air National Guard and the command of the reserve are combat ready. Upon the declaration of mobilization, more than 1,100 airplanes and 52,000 trained specialists will pour into the ranks of TAC from the reserve.

The determining element in the combat readiness of each specific reserve unit or subunit as well as for the Regular Air Force is combat capability which is evaluated in accordance with a special system. This system consists of four stages S (levels of combat capability). Each of them has its own meaning:

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S-1--completely combat capable; S-2--basically combat capable; S-3--limited combat capability, and S-4--unit or subunit not combat-capable.\*

According to a statement by official Pentagon representatives, the Air National Guard's combat readiness status appeared as follows: 90 percent of the air subunits had a combat capability level of S-3 or higher (of them, 72 subunits had C-1 and C-2) while the majority of the auxiliary ground subunits were at levels S-1 and S-2; in particular: 69 percent of the tactical air control groups, 100 percent of the subunits for installing and servicing electronic equipment, 93 percent of the signal groups and detachments, 90 percent of the air weather service detachments, and 100 percent of the construction subunits.

In the Air Force reserve command 95 percent of the squadrons were determined to be combat-capable (altogether, 41 squadrons are subject to an evaluation of a combat-capable level).

The combat-capability status of an air squadron is determined by its commander, and he reports this to higher headquarters. Checks are conducted annually by representatives of the inspector of the corresponding air army. In the opinion of the American command, the most objective results of the checks are attained with operations of the flight subunits in the course of tactical flight exercises after their redeployment to other air bases or to reserve airfields with little improvement rather than from their permanent bases.

According to evidence in the foreign press, such checks are being used ever more widely in the U.S. Air Force. Thus, if in July 1976 only one squadron of A-7D airplanes from the 169th Tactical Fighter Group of the Air National Guard (air base McIntyre Air Force Base, South Carolina) was inspected jointly with the 33d Tactical Fighter Wing of the Regular Air Force at Eglin Air Force Base (Florida), in July 1977 three air units of the Air National Guard were already subjected to such inspections: the 116th Tactical Fighter Wing (Dobbins Air Force Base, Georgia), from the airfield at Travis Field (in the same state), the 127th Tactical Fighter Wing (Selfridge Air Force Base, Michigan), from Phelps-Collins Air Force Base in the same state, and the 183d Tactical Fighter Group (Springfield Airfield, Illinois) from Volk [as transliterated] Field, Wisconsin. Now the Tactical Air Command organizes 20-25 inspections of the Air National Guard units and subunits attached to it annually. An important element of the tactical flight exercises is determination of the air squadrons' capabilities to accomplish sorties with maximum "combat" tension.

/The Air National Guard/ is the basic reserve component of the U.S. Air Force. It is part of the armed forces of the states which are subordinate to the governors and, at the same time, a component element of the Regular Air Force's organized reserve.

\* See ZARUBEZHNOYE VOYENNOYE OBOZRENIYE No 2, 1978, pp 56-58 for greater detail on evaluating the combat capability of U.S Air Force units and subunits--Ed.

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/The command of the Air Force reserve/ occupies second place in the composition of men, equipment, and significance after the Air National Guard in the organizational structure of the reserve components. The Secretary of the Air Force directs the command through his assistant (for personnel, reserves, and air installations) and the Air Force Chief of Staff.

/Modernization of the air fleet/, as indicated above, is one of the basic measures to raise the combat readiness of the Air Force reserves, and the American military leadership is conducting much work in this direction.

/State of training of the personnel/. The command is devoting great attention to the professional training of the flying and technical personnel of the Air Force reserves. Here, as noted in the foreign press, the same requirements are imposed on the training of reservists as exist in the regular units and subunits.

According to the statement of American military specialists, the subunits of the Air National Guard and the U.S. Air Force reserve command are rather widely involved in exercises of the "Red Flag" and "Blue Flag" series and other Pentagon measures. In confirmation of this, the following data are presented in the foreign press. The basic goal of the "Red Flag" exercises is for the tactical air subunits to work out the accomplishment of various combat missions in cooperation with the ground troops under conditions as close as possible to actual combat. These exercises are conducted on a specially equipped range of Nellis Air Force Base (Nevada) and, in the opinion of foreign specialists, provide flight crews with the opportunity to undergo necessary training in the practical use of on-board weapons.

In 1977, airplanes of the Air National Guard also took part in four such exercises and, in 1978, the crews of eight units and subunits were already involved in them. For example, eight A-7D attack aircraft from the 132d Tactical Fighter Wing (Des Moines Airfield, Iowa) participated in the "Red Flag" exercises in January-February, eight F-100 fighters from the 138th Tactical Fighter Group (Tulsa Airfield, Oklahoma) in March-April, and 12 F-100's from the 122d Tactical Fighter Wing (Fort Wayne Air Force Base, Indiana) in June, and so forth.

According to the appraisal of the U.S. Air Force command, the reservists' participation in such exercises raises the level of their ability considerably. The involvement of each subunit of the Air National Guard in the "Red Flag" exercises at least once every year and a half is envisaged in the future (the same standard has also been established for the regular Air Force).

Everything presented above confirms once again that the command of the U.S. Air Force is placing great hopes on its reserve components, looking upon them as a powerful means to reinforce the combat capabilities of military aviation to which an important role has been allotted in the aggressive plans of American imperialism.

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COMMENTS ON ORGANIZATION AND TASKS OF U.S. MARINE CORPS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 79 signed to press 8 Jan 79 pp 67-73

[Article by Capt 1st Rank R. Dmitriyev: "The U.S. Marine Corps"; passages enclosed in slantlines printed in boldface]

[Text] The Marines are the strike detachment of American imperialism; they are the most mobile, well-equipped troops which are constantly ready for immediate lift by sea and air to any region in the world for the suppression of the national-liberation movement of peoples and the defense of the predatory interests of U.S. militaristic circles. During the 200-year period of its existence the Marine Corps, accomplishing the role of international executioner and gendarm, participated in more than 300 military and punitive operations in various regions of the world. The aggressive wars in Korea and Vietnam, shooting at patriotic demonstrations in Panama, Columbia, and Venezuela, intervention in the Dominican Republic--this is a far from complete list of its bloody affairs over the last 20 years. The Marines showed their worth especially "actively" in Vietnam where their path was marked by many brutalities and crimes, among which was the tragedy of Songmy.

The Marines are an arm of the U.S. Navy and, as noted by the foreign military specialists, are specially trained for participation in amphibious operations and for the conduct of combat actions together with the ground forces as well as independently. Furthermore, the Marines perform police and guard functions on ships and in the Navy's shore units and installations. The total strength of the regular U.S. Marine Corps is now approximately 192,000 men.

The U.S. Marine Corps is headed by a commandant who accomplishes leadership through his staff and assistant (see figure) [not reproduced]. He is directly subordinate to the Secretary of the Navy and is responsible for the organization, combat readiness, combat training, and the equipping of the Marines with contemporary weapons and combat equipment.

The organizational structure of the Marines is based on the principle of the simultaneous existence of two organizations: administrative, which functions in peacetime, and operational, which is employed for the period of combat operations and exercises and for performing daily service as part of forward naval groupings.



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In accordance with its administrative organization, the U.S. Marine Corps includes the marine forces of the Atlantic and Pacific Fleets (regular ground forces and aviation), a reserve, ships' detachments, subunits for protecting shore installations, and support subunits and installations.

/Regular Marine ground forces/ of the fleets number three divisions, reinforcement units, and three rear services groups.

In accordance with the administrative organization, the 2d Division, reinforcement units, and the 2d Rear Services Group comprise the Marine ground forces of the Atlantic Fleet which is based on the eastern coast of the United States in Camp Lejeune (North Carolina) while the 1st and 3d Divisions, reinforcement units, and the 1st and 3d Rear Services Groups comprise the Marine ground forces of the Pacific Fleet. The 1st Division is located on the western coast of the United States in Camp Pendleton (California) while reinforcement units and the 1st Rear Services Group are at Twenty-Nine Palms (California). The 3d Division (minus a regiment), reinforcement units, and the 3d Rear Services Group are located in Japan. A regiment from the 3d Division with reinforcement and service units and subunits is quartered at Camp Smith (Oahu, the Hawaiian Islands).

The division is the highest tactical large unit of the Marine ground forces. In accordance with the new unit organization and establishment for the division which was adopted in 1977, it includes a headquarters, four regiments (one artillery), a support group, and a headquarters and reconnaissance battalion. The authorized strength is about 16,000 men. According to the assessment of American military specialists the organization, composition, and armament of the division provide for the conduct of combat operations under conditions where nuclear, chemical, and biological weapons are employed.

The regiment consists of a headquarters, headquarters company, and three battalions. It numbers approximately 3,500 men. The battalion includes a headquarters, headquarters and service company, and four companies, each of which has a command element, a weapons platoon, and three marine platoons. The battalion's armament: 81- and 60-mm mortars, the "Dragon" ATGM [antitank guided missile], 66-mm four-tube general-purpose grenade launchers, and small arms.

The artillery regiment includes a headquarters, headquarters battery, and three artillery battalions (each battalion has a headquarters battery, three 105-mm and one 155-mm howitzer batteries with mechanized prime movers).

The support group consists of two battalions: headquarters and service, and combat engineer. The headquarters battalion includes four companies: headquarters, service, communication, and military police. The reconnaissance battalion conducts tactical reconnaissance for the division and consists of a headquarters and five companies: headquarters and four reconnaissance.

The reinforcement units of the regular Marine forces in the Atlantic and Pacific Fleets include: two field artillery groups (armed with 203.2-mm and 155-mm self-propelled howitzers and 175-mm guns) and 15 separate battalions: tank

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(M60A1 tanks, 1/4-ton trucks M151A2 with the "TOW" ATGM), amphibious armored personnel carriers (APC LVTP-7), communication, radio, and servicing for the headquarters of the Fleet Marine Forces. These units are used to reinforce the expeditionary formations which are established in accordance with the operational organization.

The rear services support group supports the combat activity of the division, the air wing, and reinforcement units (receipt, accounting, storage, and issue of items of supply, repair of equipment, transportation of cargoes, medical aid, and so forth).\*

/Aviation/, a most important component of the Marines, is intended for rendering air support to its ground forces during an amphibious landing as well as in the course of combat operations on the shore. The Marine Corps regular aviation numbers about 900 combat airplanes and helicopters which are organizationally combined into three air wings and include groups, squadrons, and detachments. The 2d Air Wing is attached to the Atlantic Fleet and is based on the eastern coast of the United States at the Cherry Point, New River (North Carolina) and Beaufort (South Carolina) Marine Air Bases. The 1st and 3d Air Wings belong to the Pacific Fleet. The 1st Wing is located at the Marine air bases of Iwakuni and Futemma (Japan) and Kaneohe Bay (the Hawaiian Islands), while the 3d is on the west coast of the United States (El Toro and Santa Ana Marine Air Bases, California).

Overall leadership of Fleet Marine aviation is accomplished by the commander of Marine forces of the Atlantic (Pacific) Fleet through his deputy for aviation. This deputy is subordinate to the commander of Fleet Air Forces in questions of the training and combat employment of aviation.

The highest tactical large unit of Fleet Marine aviation is the wing. It includes a headquarters, headquarters squadron, and several groups (control groups for air and support, one or two transport-assault helicopter groups, two to four air groups), two detachments (reconnaissance and ECM [electronic counter-measures] aircraft), a squadron of tanker aircraft and a battalion of improved "Hawk" AAGM [antiaircraft guided missile] and a battery of "Red Eye" AAGM. The strength of an air wing may reach 10,000-12,000 men, and the number of airplanes and helicopters--350-400 machines.

Headquarters squadron is occupied with questions of logistic and rear area support of the air wing headquarters. The control group is responsible for the organization and functioning of the air support aircraft control system and the airwing's air defense [AD] weapons. Its composition includes the following squadrons: headquarters, communications, air support aircraft control and AD systems control (two). The battalion of improved "Hawk" AAGM and the battery of "Red Eye" AAGM are administratively subordinate to it.

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\* See ZARUBEZHNOYE VOYENNOYE OBOZRENIYE No 8, 1978, pp 72-73 for more detail on the rear services group--Ed.

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The "Hawk" AAGM battalion consists of four batteries and is intended for AD support of the division's combat formations, air bases, field airdromes of the air wing, and other important Marine installations. The "Red Eye" AAGM battery is assigned missions for the defense of the Marine division's units and subunits which are part of the forward echelons of the amphibious force against low-flying enemy aircraft. It consists of five platoons, each of which has three sections of five crews each. This battery organization permits the attachment of a platoon to a regiment, a section to a battalion, and a crew to a Marine company.

The support group accomplishes the logistic servicing and the repair of combat equipment of the air wing's units and subunits as well as necessary wheeled vehicle transportation shipments. It includes the following squadrons: headquarters and service, engineer support, and vehicle transport.

The transportation-assault helicopter group is intended for the lifting of personnel, armament, and various MTO [material and technical supply] items as well as for rendering close support for the ground forces of the landing force. As a rule, the group includes the following squadrons: headquarters and service, heavy helicopters (21 CH-53 "Sea Stallion"), two or three medium helicopter squadrons (each with 18 CH-46 "Sea Knight"), light (21 UH-1E "Iroquois"), helicopter gunships (18 AH-1G "Huey Cobra" or AH-1J "Sea Cobra"), reconnaissance-spotter (12 UH-1E "Iroquois" helicopters and 18 OV-10 "Bronco" airplanes), and also base servicing.

The basic combat nucleus of the air wing consists of the air groups which provide close and deep support in an amphibious operation.\* They include three to five attack and fighter-attack squadrons. The former squadrons are equipped with 20 A-6E "Intruder," A-4M "Skyhawk," or AV-8A "Harrier" aircraft in each while the latter each have 15 F-4J "Phantom-2" airplanes.

The air wing contains two detachments (RF-4B "Phantom-2" reconnaissance airplanes and ECM EA-6B "Prowler" airplanes which conduct visual and photo reconnaissance and disclose and neutralize the operation of enemy AD electronic equipment.

The squadron of tankers (12 KC-130F "Hercules") is intended for the aerial refuelling of airplanes as well as for the transportation of personnel and combat equipment.

For a further increase in the combat capabilities of Marine aviation, it is anticipated that the attack squadrons will be equipped with AV-8B "Harrier" aircraft or of another type, the fighter-attack squadrons with F-18 "Hornet" aircraft, and the squadrons of heavy transportation-assault helicopters will be reequipped with the CH-53E "Super Stallion" helicopters.

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\* See ZARUBEZHNOYE VOYENNOYE OBOZRENIYE No 3, 1975, pp 67-71 for greater detail on this question--Ed.

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/The Marine reserve/ includes the 4th Division, reinforcement units and subunits, the 4th Rear Services Group and the 4th Air Wing whose units and subunits are located at various points, air bases, and airfields located in the continental United States. The headquarters of the division and air wing are located in New Orleans (Louisiana).

/The Marine ship detachments/ are found on almost all large ships of the U.S. Navy's main classes. They perform police functions in maintaining internal order on the ship and shore (when personnel go on leave), and they provide security and the protection of the most important ship compartments (nuclear weapons storage areas, artillery magazines, the cryptocenter, and so forth). Under combat conditions, they can be used to reinforce the gun crews or landing detachments which are being formed. The number of personnel in the detachment depends on the class of the ship and may reach 68 men.

/Marine subunits for protecting shore objectives and installations/ of the Department of Defense, Joint Chiefs of Staff, and the Navy perform guard and police service. Just as the Marine ship detachments, they are formed from personnel of the combat units (alternating service on ships and in shore units).

Marine /support subunits and installations/ consist of ground force bases, air bases, and rear services support bases. In addition, they include the command for research projects and training programs, training units and subunits, recruiting stations, and recruit assembly points.

In accordance with the operational organization, the basic Marine formation which is intended for participation in big amphibious operations is considered to be the expeditionary division which includes a division, reinforcement units, a rear services support group, and an air wing. Its total personnel strength is about 43,000 men. For the conduct of operations which are more considerable in scale, it is intended to create an expeditionary corps including two or more expeditionary divisions.

For the conduct of an operation on a smaller scale, an expeditionary brigade may be formed. It consists of a Marine regiment, reinforcement and service subunits, and a mixed air group which may be equipped with combat air-planes (attack and fighter-attack aircraft) and helicopters as well as AD subunits. Its total personnel strength is about 10,000 men. Judging from materials in the foreign press, even now, in peacetime, the 1st Expeditionary Brigade has been formed in the United States; it is based in the Hawaiian Islands.

The basic Marine tactical formation is considered to be the expeditionary battalion which consists of the battalion, reinforcement and service subunits, and a mixed squadron of combat airplanes, transportation-assault helicopters, and helicopter gunships. Its total personnel strength is up to 2,000 men. As noted by foreign military specialists, the Pentagon constantly maintains four such battalions in a high stage of combat readiness on landing ships and transports: two in the western part of the Pacific Ocean (in the 7th Fleet) and one in the Mediterranean Sea (the 6th Fleet). In addition, one battalion is located periodically in the Caribbean Sea (in the 3d Fleet).

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The transportation of Marines to various areas of the world is accomplished by landing ships which are combined into independent forces becoming part of operational fleets. According to data in the foreign press, the American Regular Navy numbers about 70 landing ships (general-purpose, helicopter carriers, headquarters, dock ships, tank-landing ships, and so forth) which are capable of the simultaneous delivery and landing of one third of an expeditionary division on an unimproved shore. Completing the construction of general-purpose landing ships of the "Tarawa" type in 1980 (five units), in the opinion of foreign military specialists the U.S. Navy will be able to lift and land approximately one and a half Marine expeditionary divisions simultaneously.

As is known, the development of the U.S. Marines was influenced to a certain extent by the war in Vietnam where, as reported by the American press, 97 percent of their personnel served in combat or support units and subunits. The basic principles for the combat employment of Marine units, their organizational forms, the trend in combat training, and new programs for the development of more improved models of weapons and combat equipment were determined in the course of this aggressive war.

Reports in the foreign press indicate that in recent years the American command is devoting considerable attention to improving the organizational structure of the control elements and increasing the Marines' combat capabilities. Thus, in the fall of 1973 the biggest reorganization of the Marine Corps headquarters in the last 20 years was completed. In 1977, the Marine ground forces were reorganized (the organization and establishment structure of the division and service units was changed). In the course of the reorganization of the Fleet Marine Force service units, rear services groups were formed.

All this permitted reducing the number of personnel in the divisions without reducing their combat potential, increasing their mobility, and simplifying the control system but, as noted in the foreign press, did not solve all problems. In the opinion of Western military specialists, the organizational structure as a whole which exists at present is already obsolete. The United States is now conducting the development of a new, more improved, single organization which envisions the formation of permanent expeditionary large units and units capable of conducting combat operations at any time without substantial changes in their organization.

As one of the versions of the new organizational structure for the Marines, American military specialists propose the creation of permanent amphibious large units and units which recall expeditionary divisions, brigades, and battalions in their personnel, equipment, and missions to be accomplished.

It is envisioned that these large units and units will be equipped with the weapons and combat equipment which would permit landing amphibious as well as helicopter-borne forces. Here, subunits with heavy equipment as well as some fire-support and rear services support subunits will be dropped as part of the assault large units but they will be reinforced with antitank and antiaircraft weapons. American military experts assume that it will be necessary to increase

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the mobility of the Marines by increasing the quantity of transport vehicles in the subunits.

The Naval command believes that it is expedient to implement all these measures first of all in the 2d Division which, in its opinion, in case of war in Europe will be the first of the Marine divisions to take part in the combat operations which will have started there.

The reorganization of the U.S. Marine Corps which has been conducted and the search for a new, more improved organizational structure for its units as well as the plans for its reequipment show that the American leadership is continuing to seek additional capabilities to increase the effectiveness in utilizing this combat arm.

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COMMENTS ON U.S. NAVY CARRIER-BASED AIRCRAFT

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 79 signed to press 8 Jan 79 pp 73-82

[Article by Engr Col (Res) I. Kutsev: "American Carrier-Based Early Warning and ECM Aircraft"; passages enclosed in slantlines printed in boldface]

[Excerpts] In the opinion of the U.S. Naval command, under contemporary conditions the air defense [AD] missions of carrier forces, the destruction of enemy ships at sea and in bases, the launching of strikes against important shore objectives, and air support of amphibious landings cannot be accomplished successfully without calling on early warning (EW) and electronic counter-measures (ECM) aircraft. Considering the experience in employing such aircraft in wars unleashed by the imperialists in Southeast Asia and the Near East, U.S. military specialists began to improve on-board EW systems and ECM equipment and to equip special-purpose and combat carrier-based aircraft with them at the beginning of the 1970's. Presented below is information taken from the foreign press concerning the main carrier-based E-2C "Hawkeye" EW aircraft and the EA-6B "Prowler" ECM aircraft which are in the aviation inventory of the U.S. Navy.

/The E-2C "Hawkeye" EW aircraft/ (third modification E-2) has been produced serially since the middle of 1971 and, by the beginning of 1977, the fleet had received 34 machines. Orders have been placed for the purchase of 47 more aircraft, of which it is planned to deliver 36 to the Navy by the end of 1984.

During exercises and combat training, as indicated by the American press, the E-2C demonstrated high reliability. Despite complex equipment, 79 percent of the airplanes were always ready for repeated takeoff, comprising 92 percent of the existing standards.

/The EA-6B "Prowler" ECM aircraft/ (Fig. 2) [photo not reproduced] is the basic ECM aircraft of the U.S. Navy. Accepted into the inventory in 1972, it is intended for support of carrier-based air and surface ship operations. Furthermore, it can conduct electronic reconnaissance and accumulate data on enemy radar.

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Judging from reports in the foreign press, the Navy planned to purchase 77 EA-6B aircraft. Ten squadrons (four aircraft in each) were formed by the middle of 1977. Their series production is continuing.

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COMMENTS ON U.S. INDIAN OCEAN BASE ON DIEGO GARCIA

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 1, Jan 79 signed to press 8 Jan 79 pp 84-86

[Article by Lt Col V. Matveyev: "Diego Garcia--U.S. Military Base in the Indian Ocean"]

[Text] In recent years, the zone of the Indian Ocean has been attracting more and more attention of the imperialist circles of the United States as a strategically important area which occupies an advantageous geographical position. The basic routes connecting Europe with East Africa, the Asiatic countries, Australia, and Oceania pass here. Ten percent of the world freight turnover and three-fourths of the oil shipments of the nonsocialist states use the Indian Ocean. Considerable reserves of gold, oil, tin, natural rubber, and other raw materials are concentrated in this zone. The major portion of the minerals extracted here are exported by developed capitalist states, which transforms this region into a raw-materials appendage of the western monopolies.

More than 30 countries are located on the coast of the Indian Ocean, many of which are among developing countries. Recently, they have been intensifying the struggle to attain political and economic independence.

The military-political leadership of the United States, expressing serious fears concerning the intensifying process of decolonization in this region and the possibility of a weakening of its economic positions, is making more active the conduct of the so-called "island strategy." Its goal is to provide the Pentagon with strong points on islands to control sea lines of communication and exert pressure on the states of the region. Within the framework of this strategy, Washington is conducting vast work on modernizing naval and air bases on Diego Garcia Island--an "unsinkable aircraft carrier" of the United States. According to the concepts of American militarists, it joins together the network of bases created in Western Europe and the Near East with the ramified system of bases in Asia and the Pacific.

Diego Garcia is an island of coral origin (an atoll)--part of the Chagos archipelago which is located almost in the center of the Indian Ocean. It is more than 19,000 km from the nearest U.S. seaport and about 1,800 km from the southwestern coast of India.

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The island is horseshoe-shaped in its configuration (Fig. 1) [not reproduced]. Its area is about 29 square kilometers and the length of the shore line is almost 60 km. Small islands are located at the mouth of the lagoon which has a length of about 21 km and a width of up to 10 km--Western, Middle, and Eastern. The atoll is surrounded by coral reefs which are located at a shallow depth. The climate here is tropical and approximately 2,540 mm of precipitation fall annually. The mean annual humidity of the air is about 80 percent, causing increased corrosion of equipment.

The atoll is part of the so-called British territory in the Indian Ocean. In 1965, it was separated from the Seychelles Islands.

In December 1966, the governments of Great Britain and the United States concluded an agreement about the use of the island for military purposes in the interests of both states. In accordance with this agreement, the United States received the right to use the atoll for 50 years and to construct a naval installation here to provide communications with American ships and aircraft crossing the Indian Ocean.

In 1972, the United States and Great Britain signed an additional agreement which defined the scales of construction at the Diego Garcia naval communications center and a number of other structures. This marked the beginning of the creation of a new U.S. military base in the Indian Ocean.

In 1976, the United States concluded the next agreement with Great Britain which lifted virtually all preceding restrictions. It also provided for the possibility of using the base by ships and aircraft of the United States, Great Britain, France, and Australia. In the agreement, it was stipulated that all expenditures on the construction, assembly, and operation of the equipment would be borne by the United States.

Beginning in 1971, each year the U.S. Congress approves appropriations for expansion of the Diego Garcia base. It is planned to complete its construction in 1980. According to an estimate in the American press, total expenditures will be 175-200 million dollars.

Work on the Diego Garcia base is being conducted by engineer-construction units of the U.S. Navy. All the structures being erected here are one-story. To provide entry of ships to the base and exit from it a navigable channel 229 meters wide and 5,600 meters long has been cleared in it with a place for turning having dimensions of 838 x 1,436 meters.

The base's communications center permits executing control of the U.S. Navy's nuclear submarines which are in the basin of the Indian Ocean and conducting radio intercept and the intersection of radio emissions of various vessels and ships. The base can also be used by strategic aviation.

As of 1978, there were 1,300 American and 25 British on Diego Garcia. The following installations had been constructed and turned over for operation: a big

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transmitting and receiving radio center of the U.S. Navy communication center, a pier capable of receiving any combat ships (Fig. 2) [photo not reproduced], an airfield with a runway up to 3,600 meters long and a group parking place for airplanes, a POL [fuels and lubricants] depot with a capacity of up to 100,000 tons, an ammunition depot, hangars, warehouse and repair-restoration areas, a diesel electric power plant with an output of 7,500 kW, a residential cantonment, buildings for cultural and everyday purposes, and local television and radio stations.

Four land-based "Orion" patrol aircraft and two C-141 transports are constantly located at the base.

Work is continuing on the further improvement of the airfield, deepening the harbor, building warehouses and hard-surface roads, and expanding the residential cantonment.

Thus, by 1980 it is planned to complete the creation of one more strategic strong point of American imperialism in the Indian Ocean on Diego Garcia atoll.

COPRRIGHT: "Zarubezhnoye voyennoye obozreniye", 1979

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COMMENTS ON NATO MILITARIZATION AND THE ARMS RACE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 3, Mar 79 signed to press 7 Mar 79 pp 3-9

[Article by Col I. Belov: "NATO: On the Path of Militarization and an Arms Race." Passages in slantlines printed in boldface]

[Text] The tendency towards a relaxation in international tensions, which has begun to exert an influence on the overall development of processes occurring in the world, is a determinant of the contemporary international situation. This was possible thanks to the intense struggle by the Soviet Union and the other fraternal socialist countries against the forces of the war and aggression, which are not only diminishing at the present time but are also acquiring even greater intensity. Under contemporary conditions there is no other task more important than achievement of real disarmament. "Stopping the arms race, insuring a movement towards a decrease and, in the final analysis, elimination of the threat of a thermonuclear catastrophe," CC CPSU General Secretary and Chairman of the USSR Supreme Soviet Presidium comrade L. I. Brezhnev announced, "this is the fundamental problem now on the agenda of our life."

There are, however, influential and well-organized forces in the world interested in the arms race and intensifying the atmosphere of fear and enmity. They sow doubts about the possibility to accomplish practical measures for the limitation of arms and for disarmament and are hindering achievement of agreements in this area. Their activities have noticeably increased recently. "In the offensive by imperialistic and reactionary forces against the position won by the people in the difficult struggle for stable peace and international security," as stated in the Declaration of the Warsaw Pact states, "the goals of aggression, revanchism, and hegemony are being pursued."

The aggressive NATO military-political bloc led by the United States has been in the vanguard of these forces for 30 years now. They represent now the main danger for peace and international security by advocating intensification of the arms race and stepping up its tempos and scales. All of its activities irrefutably testify to the militaristic preparations being accomplished in NATO at ever increasing rates.

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The policy of "from a position of strength" is the credo of the Atlanticists during the three decades that the bloc has existed. And, without any shame, such diehard militarists as NATO Secretary General Luns, American Gen Haig, SACEUR, and West German and English generals in recent days continually make reference to this in their speeches. All these bellicose statements are hidden behind the irritating myths concerning the "Soviet military threat," although of course they can provide no concrete evidence whatsoever in support of their statements because such evidence does not exist. At the same time their provocative activities during the entire period of the bloc's existence show the aggressive desires of the United States and NATO. On their conscience are numerous armed interventions, coarse interference in the internal affairs of many countries and peoples, wide-ranging support of mercenary dictatorial regimes, and ideological diversions against the socialist countries. Was it not these very desires that the American Gen Dixon announced at a meeting with reporters when he said: "War is our daily bread." Former Chairman of the JCS Gen Brown, calling for an increase in the power of nuclear weapons, was even more frank about the misanthropic desires of American imperialism: "Is it not important for us (that is, the United States--I. B.) to be capable of destroying 160 million people rather than 90 million?" It is clear from all of this where the threat to peace and progress in our time lies.

The NATO countries do not restrict themselves only to militaristic appeals. They are practically speaking accomplishing numerous measures for further building up of the power of their armed forces. The arms race in these countries has now achieved unprecedented dimensions and new means for the mass destruction of people are being developed. Inflating military budgets and receiving billions in profits annually, U.S. and NATO militarists reject any proposals by the socialist states on limitation and reduction of troops and weapons. Moreover, in 1978 at President Carter's initiative, decisions which presuppose new unprecedented increases in military preparations were made at meetings of the bloc's governing organs.

NATO ruling circles in their aggressive desires are now broadly employing the services of the Beijing subsidiaries, not overlooking any opportunity to provoke the arms race in the capitalist countries. It is not accidental that in the West China is now being referred to as the "16th member of NATO," that the Chinese leaders are "true friends." Pursuing the goal of strengthening the "second front" against the Soviet Union, the countries in this bloc are sending China modern weapons and technologies of their production. The "normalization" of relations between China and United States and other countries in the bloc is already a fact. Soon after the voyage of Deng Xiaoping across the ocean, Beijing unleashed its evil aggression against socialist Vietnam.

The leadership of the North Atlantic Union approves the militaristic ambitions of imperialist circles in Japan. In this connection the idea of "close coordination of the military efforts" of NATO and Japan, as well as creation of a branch of this bloc in the Far East in the form of a trilateral military union between the United States, China, and Japan is coming to light. The foreign press also reports the intentions of the imperialists to create a military bloc in the Middle East, which Israel, Egypt, and Saudi Arabia supposedly intend to join.

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Striving to vitalize the militaristic intoxication in NATO, jack up the arms race, and "to strengthen trust" in the United States on the part of influential circles in other bloc countries, the U.S. Government declared 1978 as "the year of NATO" and its official representatives, including President Carter as well, continue to remind people that this bloc and Europe are the cornerstone of the American state's military-political policy.

/Military expenditures by the NATO countries continue to grow./ Based on U.N. data, military expenditures throughout the world in 1978 were approximately 400 billion dollars. At least half of this enormous sum falls to the NATO countries. Their appropriations to military departments alone last year exceeded 190 billion dollars, with 30-40 percent of the allocated funds intended for purchase and development of new weapons and combat equipment. Thus, the U.S. Defense Department for these purposes was allocated more than 40 billion dollars. The military expenditures in the bloc countries in 1979 will increase even more. For example, this fiscal year the Pentagon received approximately 130 billion dollars, and the total military appropriations in the FRG according to foreign press reports are at least 56 billion marks.

During the 30 years that NATO has existed its participants have spent for military departments alone the astronomical sum of almost 2.65 trillion dollars. These then are the true records and the sad result of the activities of militarists at the jubilee of the North Atlantic Union. During this time the annual military expenditures of the NATO countries overall grew by a factor of 10.5, with those of the bloc's European countries growing even more--by a factor of 15.

Expenditures for military purposes in the bloc countries for the past 10 years has grown especially sharply, i.e., during that period when all people of good will carried on the stubborn struggle for detente. They totalled 1.3675 trillion dollars, i.e., more than one half of NATO expenditures for the entire time that the bloc has existed.

In future years, as the foreign press notes, the growth rates of military expenditures in the NATO countries will not decrease, since the United States succeeded in imposing upon them an annual increase in military appropriations of at least three percent in constant prices. Attempting to set an example for its bloc partners, the U.S. Government plans to increase the amount of appropriations for the Pentagon by 10-12 billion dollars per year and bring them by 1983 up to 172.7 billion dollars.

Where are these enormous resources directed?

/Continual growth in bloc military potential./ This is the basic trend in the activities of U.S. and NATO ruling circles. "One of our main concerns," U.S. Deputy Secretary of State Christopher announced, "is linked with modernization of the NATO armed forces. . .at our initiative our NATO allies at the recent summit meeting in Washington agreed to make unprecedented joint efforts to satisfy on a coordinated basis our collective requirements in the military sphere." U.S. Defense Secretary Brown noted that "the United States budget gives special priority to weapon systems in support of NATO." This shows that leaders of the

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United States and of the bloc are not satisfied with the enormous military machine created in NATO. They strive for an even greater intensification of the military potential of this aggressive organization.

The center of attention of the U.S. leadership just as before is a further growth in the power of the strategic nuclear forces at a time when, as the foreign press notes, the nuclear arsenal of the NATO countries today exceed by a factor of two million the destructive force of the American atomic bomb dropped on Hiroshima. Extant deadly weapon systems are being improved in the United States and new mass destruction means are being developed on an accelerated basis. More powerful warheads with a high degree of accuracy are being installed on Minuteman-3 missiles and heavy B-52 strategic bombers are being modernized.

Development of the new MX mobile-based ICBM continues and it is expected to enter the inventory in the mid-1980's. At least 30 billion dollars are planned to be spent in the development and purchase of 200-250 such missiles. Different variants for their underground basing and secret movement to reserve firing positions via connecting tunnels are envisioned for the purposes of increasing the survivability of these systems.

Construction of new sea-based Trident nuclear SLBM systems is underway at full speed. One-two boats are laid down each year. Construction of the first (the "Ohio") is to be completed in late 1979. By 1985 these boats will be equipped with Trident-1 missiles with a range of 7,400-7,800 km and following this by the Trident-2 (more than 11,000 km) with multiple independently targetable maneuvering warheads (the MARV type). Each boat with a displacement of 18,700 tons will carry 24 missiles. A construction program has been approved for 13 SSBN's. The Pentagon is studying the question of building 29-30 such boats. This program is planned for completion by 1992. A base costing more than 2 billion dollars is under construction so that the new SSBN's can be based in the northwest portion of the United States at Bangor (Washington state).

In order to accelerate the new Trident-1 missiles coming into the inventory, 12 submarines equipped with Poseidon-C3 missiles in the near future will be reequipped with the former. The first SSBN conversion began in September 1978. The plan for the past two years was to purchase 144 Trident-1 missiles.

Work is noticeably being stepped up in the United States to build cruise missiles, primarily to augment the strategic nuclear forces. The intent is to equip B-52 bombers with cruise missiles and, possibly, some transport aircraft as well. Also 33 nuclear submarines will be equipped with cruise missiles to be fired from the torpedo tubes. The sea- and air-launched missiles are expected to enter the inventory in the early 1980's. The plan is to purchase 1,200 sea-launched and 3,400 air-launched missiles.

Meanwhile, the U.S. Government decided to temporarily postpone development of the B-1 strategic bomber, although testing of the aircraft continues. Thus, 55 million dollars were allocated for these purposes for fiscal year 1978/79.

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Lately U.S. and NATO militaristic circles are more steadfastly demanding creation of medium range ballistic missiles and their basing in Europe.

Research and development is more actively underway in the United States on creating more powerful nuclear ammunition with multiple reentry vehicles of the MIRV and MARV types, as well as of improved missile guidance systems.

Reports appeared in late 1978 in the American press about development of the so-called beam weapon. This is a weapon in which the energy of lasers and elementary particles (the electron, proton, and neutron) is used. This weapon is primarily intended for use against missiles and satellites. According to foreign press data, a five-year program for creation of such weapons has been elaborated in the United States and they will enter the inventory in mid-1980's. Large financial resources are being allocated for these purposes.

Significant work is underway in France to modernize the strategic nuclear forces. As a result, as announced by the chief of staff of the French Armed Forces Gen Mery, their strike power will triple in 1980.

In recent years great measures have been taken in all NATO countries to improve general purpose forces. Reorganization of the armed forces with the goal of equipping formations [soyedineniye] and units [chast'] with tanks and other armored equipment, antitank, antiaircraft artillery, and other resources has been completed in many of these countries and continues in several of them. Personnel strength has been somewhat decreased in units and subunits [podrazdeleniye] and they have been significantly beefed up with conventional weapons and combat equipment. Many formations have been reorganized as armored formations. For example, all four divisions in the British Army on the Rhine based in the FRG were recently converted to armored divisions. An artillery division has also been formed in the BAOR.

A significant reinforcement of the combat complement of the ground forces is expected in the United States and France. The foreign press reports that three new formations are being formed in the American Army and, in addition, tests of a new organization of the armored and mechanized division, in which the number of personnel and of artillery pieces, antitank guided missiles, antiaircraft artillery resources, and of combat battalions increased (from 10-11 up to 15), are continuing. In 1978 the number of American troops based in the FRG increased by 8,000 persons. Their deployment in the northern portion of the country is increasing due to the transfer of one more brigade to that area.

The foundation for the reinforcement of the armed forces in the NATO countries at the present time is the equippage with new types of weapons and combat equipment. This is the very thing that the United States is now achieving from its allies. During the May 1978 Washington meeting of the NATO Council, on the initiative of U.S. President Carter and under pressure from the Pentagon, a broad program for upgrading bloc troops in Europe and primarily those troops based in the Central European TVD [theater of military operations] was passed. In addition to the approved annually shifting five-year plan for the organizational development



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of the bloc armed forces, the session approved a plan for strengthening the armed forces, which envisioned accomplishment of urgent measures by the end of 1978 and a long-term upgrade program for a period of 10-15 years which, according to the foreign press, should include 117 different measures.

According to the latest plans, the intention is by the end of 1978 to significantly strengthen antitank capabilities of formations and units and to also augment prepositioned equipment reserves, primarily ammunition. The western press reported, by the end of this period, the number of antitank guided missiles in NATO troop units in Europe is to be increased by 47,000 units (i.e., by more than 30 percent compared to 1976) and to bring them up to 193,000.

The long-term program (Long-Term Defense Program) envisions in the forthcoming 10-15 years spending 80 billion dollars for additional measures to strengthen bloc armed forces in Europe, and primarily in the Central European TVD. Planning in accordance with this program involves: modernization of nuclear and conventional forces in the theaters of military operation; raising the combat readiness of formations and units including reserve components; acceleration of delivery to Europe of strategic reserves from the U.S. and Canada in a period of tension; more reliable security for communications in the Atlantic; qualitative improvement in air defenses; improvement in control and communications systems to insure timely consultation of bloc member governments and acceleration in the reaction of command elements and staffs to situational changes; more rapid introduction of radio electronic combat equipment to troop units; expansion of standardization in weapon development and production; increase in prepositioned equipment stocks and their siting on the more probable axes of formation operations.

The program allots a special place to further improvement of the nuclear arsenal in the theaters of military operations, including increase in the power of nuclear ammunition, increase in target destruction accuracy, as well as bringing new means of mass destruction--neutron ammunition--into the inventory. All people of good will protest equipping the troops with this barbaric means of destruction. However, the American government does not wish to listen to the opinion of society and, in its decision, production began on the components of neutron weapons. The foreign press reports that a standardized warhead has been developed in the U.S. for tactical nuclear weapons making it possible to employ both the conventional nuclear as well as the neutron charge, with its conversion supposedly taking very little time. In this connection, foreign specialists note that, ignoring public opinion, the American government can place neutron ammunition in Western Europe covertly and employ it in the future at its discretion.

Conventional weapons in great numbers have also been supplied to the troop units of all bloc countries. The intention is in the 1980's to equip all formations and units with new generation weapons and combat equipment. The Pentagon especially is buying a great deal of weapons. Appropriations for these purposes in the last two years increased by 95 percent. The Pentagon leadership examined the question of weapons and combat equipment requirements and decided to significantly increase their number in connection with a reevaluation of possible losses during a war. The requirements for tanks as a reserve, for example, grew by a factor of 2.5, armored personnel carriers by a factor of 6, and F-16 fighters by a factor of more than 2. Formations and units intended for transfer to NATO in the next

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five years, according to the American press, will receive 4,000 new tanks and 2,000 tactical fighters. In all, the American Army command element intends to order in excess of 14,000 new XM-1 Abrams tanks. They will enter troop units in 1979. The U.S. Air Force and Navy are being equipped with new F-14, F-15, F-16, and A-10 combat aircraft, which are being purchased in large numbers.

The new U.S. leadership reexamined the plan for future Navy construction. It reduced the appropriations envisioned by the former White House administration for the next five years for accomplishment of the shipbuilding program and, by 1983, intends to have 525 ships of the basic classes (but not in excess of the 600 units as earlier intended). The proposal here is to place even greater attention on improving the specifications of the ships and raising their combat capabilities. In the early 1980's, the U.S. Navy plans to equip 15 surface ships with cruise missiles.

Bloc European countries within the framework of the so-called NATO Eurogroup also annually are making additional pledges to purchase large weapons consignments. An especially large number of weapons is going to the Bundeswehr. In the opinion of NATO Secretary General Luns, the Bundeswehr is a combat force "without equals." And, one American general said that these are "the best trained and best equipped forces in Europe." The Bundeswehr leadership intends by 1985 to expend at least 40 billion marks for the purchase of new weapons. Thus, the armed forces will obtain 1,800 Leopard-2 tanks, 432 Gepard self-propelled antiaircraft guns, 140 Roland surface-to-air missile units, 212 PAH-1 antitank helicopters, 175 Alpha Jets, 322 Tornado fighter-bombers, as well as 6 guided missile frigates.

Army aviation is being supplied with significant numbers of antitank helicopters armed with antitank guided missiles. Thus, 10 antitank helicopter companies are being formed within the American troop units in Europe and three regiments (one per army corps) and one battalion for the 6th Motorized Infantry Division are being formed in the Bundeswehr.

NATO has made the decision to purchase E-3A American aircraft for the AWACS [airborne warning and control system] long-range radar detection and control system. The plan is to purchase 18 of these "aerial spies" which will be based on the territories of the bloc countries in Europe. In addition, England intends to supplement this system through inclusion of 11 Nimrod aircraft.

Capabilities for transferring strategic reserves from the United States and Canada to Europe are significantly increasing. In order to accomplish these missions if necessary, the intention is to widely use civil aviation aircraft and the commercial vessels of all bloc countries in addition to military transport resources. The intention here is, according to the American Adm Kidd, CINCLANT, to supply to Europe approximately 1.5 million people and a large amount of cargo. The transfer of personnel would be mainly accomplished by air, while heavy equipment and large cargoes (90 percent) will move by sea. The United States envisions in two weeks to double the size of the ground forces in Europe and triple the air forces in one week. In this connection, work has been accomplished to improve the West European infrastructure for receiving troops

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and cargo from the ocean. The intention is to stockpile heavy combat equipment for five American divisions in Europe.

/The scale of NATO militaristic demonstrations grows./ In recent years the NATO command element continued to step up the large troop maneuvers and command and staff exercises. Just as before, they took place in various zones of Western Europe, in the east Atlantic and the southeast portion of the Mediterranean Sea. The FRG during the entire fall of 1978 practically speaking became an arena of "Atlantic encounters." The greatest part of the exercises and maneuvers under the code name Autumn Forge-78 was conducted on its territory and primarily in areas close to the borders of the socialist countries. Even official representatives of the West German Government were forced to recognize that these exercises were the largest conducted in this part of Europe in the postwar years. The western press reports that participants included more than 320,000 men, 5,000 tanks, up to 2,700 combat aircraft, a large number of armored personnel carriers, as well as approximately 300 different ships. During the exercises, as foreign press reports noted, realistic plans for conducting combat operations using both conventional and nuclear weapons were exercised. This was all done from an integrated concept and on a patently anti-Soviet, anticommunist background.

During the Reforger-10 maneuvers subunits from several formations, whose personnel previously had not transferred to Europe (the 9th Infantry Division and the 5th Mechanized Division) were transferred from the United States to the FRG. During the Bold Guard-78 exercise in the Baltic Straits area, a brigade of U.S. Marines participated for the first time. The bloc's largest exercise in history, Northern Wedding-78, was conducted in the East Atlantic and in the English Channel and it involved the armed forces of 10 NATO countries. The bloc militarists also greeted 1979 with a new rattle of weapons: for the first time in the past five years, reforger maneuvers were conducted under winter conditions.

All of these militaristic demonstrations, just as before, were conducted near the border of the socialist states, had a patently provocative nature, and were intended to create a situation of fear and to exacerbate international tensions.

From the far from complete list of NATO military preparations enumerated above it is clearly evident that this bloc is now the most aggressive grouping in the capitalistic world, whose activities are primarily directed against the fraternal socialist states. All this requires that Soviet troops and troops from other fraternal socialist states continually increase their vigilance and always be prepared to inflict a crushing blow on any aggressor.

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COMMENTS ON U.S. AND NATO VIEWS ON RADIOELECTRONIC WARFARE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 3, Mar 79 signed to press 7 Mar 79 pp 10-14

[Article by Engr-Col F. Dmitriyev, candidate of technical sciences: "U.S. and NATO Command Elements' Views on Radioelectronic Combat (REC)"]

[Text] The military-political leaders of NATO in their desire to achieve superiority over the Warsaw Pact countries continually search for the capability of employing for military purposes the latest achievements in scientific-technical progress. NATO bosses place special stock on employment of the newest means and methods of radioelectronic combat (REB--REC). Thus, one official U.S. Army handbook underscores that any commander can suffer defeat regardless of troop strength if he is deprived for any reason (including REC) of the capability to control formations (units) [soyedineniye, chast'] and to transmit requests for fire support and MTO [logistic support]. Foreign military specialists think that, during combat operations, the opposing sides will conduct an unseen but active struggle for the purpose of suppressing enemy means of controlling troops and weapons.

In official U.S. and NATO documents this covert type of combat operation involving radioelectronic resources is referred to as "electronic warfare" [EW]. Its main purpose is to preclude or reduce the effectiveness of enemy use of radiated electromagnetic energy, as well as its employment by his troops.

Foreign military specialists look upon REC as a combination of measures worked out by command and control organs and in troop units, which are conducted to obtain information concerning the nature of the operation and the location of enemy sources of radio radiation in order to hinder or destroy their functioning, as well as to protect his radioelectronic means against radio and radio-technical reconnaissance and radioelectronic suppression accomplished by the enemy.

In NATO REC is organized both in the general plane--in the scale of the entire bloc (control organs) and individual participating countries (development of policies and views, financing, and so on) as well as in the specific plane--directly within troop units (measures and activities of command elements, staffs, formations, and units to organize and conduct REC).

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In the United States general trends in the military policy in this area are determined by the Joint Chiefs of Staff (KNSh--JCS) and by the Radioelectronic Combat Agency within NATO. In 1971 the Electronic Warfare Division was set up within the JCS (in the Operations Directorate of the Joint Staff). Its basic missions, judging by western press reports, are the following: elaboration of concepts and trends in the development of REC resources; coordination of the activities of military organs involved with these questions; monitoring the condition of special resources within the armed forces components; participation in elaborating plans for the unified and specified commands; coordinating the work of the corresponding scientific research institutions, research and development themes, and other tasks. Similar organizations were set up in the military departments in the armed forces and in the staffs of the U.S. unified and specified commands.

In the foreign press REC questions are most fully examined as they relate to combat operations conducted by troop units. Measures involving REC are included in the operational and other plans of commands at all levels. The thought is that, in a future war, widespread distribution of electronics will exert a substantial influence on the nature of combat operations. Even in peacetime the staffs and troop units in the armies of the NATO countries comprehensively prepare for this specific type of combat. Thus, special formations have been set up in the American ground forces (corps and division REC battalions, army security service units and subunits [podrazdeleniye]), and there are combat aircraft and ships of the basic classes that have been equipped with a significant amount of REC equipment.

According to the views of American military specialists, REC is divided into three basic types: radio technical reconnaissance, radioelectronic suppression (REP)\*, and radioelectronic counter-countermeasures (protecting one's own means against enemy ECM).

Radio technical reconnaissance, as a rule, is conducted using special equipment and envisions the search, intercept, identification, analysis, and determination of target location. It is considered that electromagnetic emissions carry information which makes it possible to hide the organization of control over enemy troops and various weapons systems. For this, all data concerning targets with their specific characteristics are transmitted to formation (field force) [ob'yedineniye] coordinating centers, where decisions are made about subsequent actions.

Radioelectronic suppression is designed to forestall or hinder the operation of enemy electronic resources through emission, reflection, or re-radiation of electromagnetic, acoustical, and infrared signals. The main advantages of this type of REC (as opposed to destruction by fire) are the practically instantaneous retargeting, simultaneous effect on a number of targets working on identical or sufficiently close frequencies, and great range. The arsenal of modern means for such suppression is sufficiently large--ranging from complex automated land-based (Fig. 1), shipboard, and airborne (Fig. 2) [no figures reproduced in this

\* In several foreign sources this type of REC is called electronic suppression--Ed.

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article] systems for emitting ECM and high-altitude nuclear bursts to dipole reflectors and camouflage smokes. Foreign specialists also include measures to provide the enemy with fabricated information in this type of REC.

Radioelectronic counter-countermeasures, as reported in the western press, is a type of REC envisioning actions to insure effective use of the electromagnetic spectrum by friendly troops in opposition to enemy REC resources. Instructions on the use of electronic communications equipment list basic and reserve frequencies for each command link. It is considered that timely frequency changes significantly hinder detection of targets based on their electromagnetic emission. Western military specialists propose that success of radio-electronic counter-countermeasures greatly depends on quality of personnel training and upon the significance given this subject by the commander.

Protection against ECM, as underscored in the foreign press, envisions the conduct of technical and organizational methods involving countermeasures against enemy radio, radio-technical, and electro-optical reconnaissance and insuring normal operation of friendly radioelectronic equipment under conditions that they are suppressed by the enemy. Foreign specialists also sometimes include among REC problems questions of electromagnetic compatibility--excluding the mutual influence of one's own radioelectronic equipment on other friendly equipment.

American specialists consider that when conducting REC one must take into account target function: are they functioning within a communications system or do they serve to control various weapons types? In their opinion, for example, radio reconnaissance missions are more important than suppression missions because it is necessary to organize REC against enemy communications means in such a way that there is no degradation in efficiency of intercepting information transmitted by the enemy via radio communications means. According to the U.S. evaluation, means of suppressing various weapons types (in opposition to targets used in a communications system) should simultaneously be both reconnoitered and suppressed. This circumstance stipulates distribution of missions among special units and subunits. Thus, REC in the U.S. Armed Forces against radar, radio navigational, and other enemy targets is accomplished by special corps and division units (subunits) and by combat ships and aircraft. REC against communications targets is accomplished by unit resources within the armed forces component security services. They will accomplish ECM against enemy radio nets based upon orders from formation commanders in such a way that this will not degrade their own accomplishment of the basic mission--accomplishing radio reconnaissance.

As emphasized in the American military press, army and air force REC resources during combat operations will accomplish support to combat formations by supplying ECM against troop command and control systems and against weapons which have electronic control and guidance systems. Active ECM is planned primarily to disrupt basic command point communications nets, especially on the main axes, and providing fabricated information which, according to foreign specialists, will deprive the enemy of the capability to react in a timely manner to changes in the situation, decrease the effectiveness of fire support, hinder control of aviation and coordination between the ground forces and tactical aviation, and so on. It is recommended that the army corps commander personally and through the staff

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assign missions and distribute REC and reconnaissance resources. Coordination of the work of these resources in the "corps-division link" is considered one of the important elements in combat organization.

Increase attention to unification of the efforts of all types of reconnaissance and REC was noted in foreign armies after the 1973 Arab-Israeli war during which, in the opinion of NATO military specialists, new capabilities of REC resources during ground operations (combat), especially on the offensive, were revealed. Also being emphasized is the necessity to organize precise and close coordination between REC resources and combat subunits.

Judging by foreign press materials, the air force has greater capabilities in the REC arena in comparison with other armed forces components since it is better equipped from the technical point of view. For example, U.S. aviation for effective countermeasures against enemy radioelectronic resources possesses a significant amount of varied REC equipment. In particular, installed aboard combat aircraft are reconnaissance devices, ECM pods, and devices for dropping antiradar reflectors and infrared decoys (to divert IR missiles away from the aircraft). In perspective, in the opinion of foreign specialists drones and one-time usage ECM transmitters will find widespread use. The foreign press emphasizes that even today availability of on-board REC equipment facilitates getting through enemy air defenses.

REC missions accomplished by carrier and land-based U.S. Navy aviation in essence are analogous to the air force missions. Foreign military specialists especially note the problems of protecting ships against antiship missiles launched from various platforms. Equipment supporting solution of this problem in operating principle differs little from REC equipment installed on aircraft, but it is more complex in construction (Fig. 3), has a higher output of radiated ECM signal, and as a rule, is automated. This includes shipboard radio technical reconnaissance and radio electronic suppression sets, as well as unguided rocket launchers equipped with antiradiation reflectors and infrared decoys. Special aircraft are used in naval aviation: for radio technical reconnaissance (EC-121) and radioelectronic suppression (EA-6B). The navies of the NATO countries are placing great hopes on drones built to carry on REC.

What has been stated confirms that the military-political leadership of the North Atlantic bloc in their militaristic preparations continually consider the ever-growing role in military affairs of radioelectronic equipment and its influence on strengthening the combat might of the armed forces. At the present time, foreign specialists look upon electronic warfare even now not as a secondary measure intended to accomplish a particular mission arising during an operation (battle) but a necessary component of the armed struggle on any scale requiring careful planning, close coordination with the activities of other resources, and integrated leadership on the part of the command element (commander) and the staff.

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COMMENTS ON NATO INTEGRATED AUTOMATED COMMUNICATIONS SYSTEM

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 3, Mar 79 signed to press 7 Mar 79 pp 32-36

[Article by Lt Col G. Firsov: "NATO Integrated Automated Communications System"]

[Text] The leadership of the aggressive NATO bloc, hiding behind the false slogan of the "Soviet threat," is making ever-growing efforts to improve the command and control system both for the unified North Atlantic Union armed forces, and of the troop contingents of national subordination which transfer to bloc subordination in a crisis situation. In the opinion of NATO military specialists, measures to modernize and further develop the NICS (NATO Integrated Communications System), the beginnings of which date back more than 20 years, must play the chief role in improving the effectiveness and reliability of command and control\*.

From the moment NATO was founded in 1949 until the late 1950's all bloc military command and control elements were completely independent and intended to support the communications of the main NATO command elements in the TVD [theaters of military operations] (independent of each other) with subordinate troop contingents allocated by participating nations to bloc subordination. These communications in the most part were accomplished via the telephone and telegraph lines of the national post and telegraph ministries.

In 1957 the NATO Armed Forces Staff in Europe recognized the advisability of creating an effective integrated automated communications system which would supply all command and control links with the requisite data for rapid decision making for leadership of bloc resources under any conditions of the international situation.

As a result of measures taken NATO by 1970 had several extant communications and control systems, the most significant being the ACE High tropospheric communication system linking the northern extremity of Norway via Great Britain,

\* See ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 2, 1976, pp 104-108--Ed.

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central Europe, and Italy to Greece and beyond to the territory of Turkey (Fig. 1). [No figures reproduced in this article] The main tropospheric communications line consisted of 49 tropospheric stations and 41 radio relay stations forming the connections between them. With establishment of ACE High, a good portion of the exchange of telephone and telegraph information in the bloc higher command element link, as well as with national command elements, transferred from the communications lines of the national post and telegraph ministries to the tropospheric communications mainlines. Along with ACE High was the so-called NATO-Wide Communications System, it provided automatic exchange of information between the highest bloc command and control organs and the leadership of the participating countries, as well as directly between these countries. Practice in operating independent command and control and communications systems showed that none of them in isolation could satisfy requirements laid down by the contemporary conditions of warfare.

After 1970 the NATO command element directly set about elaboration of plans to create a modern communication system more completely responding to its aggressive desires. The basic idea of these concepts was to form an integrated unified communications system based upon extant automated telephone and telegraph communications systems of the NATO country armed forces and primarily that of the U.S. Armed Forces in Europe, as well as on the basis of the networks of the national post and telegraph ministries. It would include the ACE High tropospheric communication system, the SATCOM satellite communications system, and the NATO Armed Forces radio and radio relay communications nets. The so-called principle of "netting" formed the foundation of its layout. It is a matter whereby the elements of the communications and command and control system do not form an organizational and regulation troop unit structure, but are completely independent elements. The communications centers for subunit [podrazdeleniye], unit [chast'], formation [soyedineniye], and so on command and control points can be linked into a system as separate correspondents. This structural principle, according to foreign military specialists, makes it independent of the troop unit combat formation and of its complement, in so doing increasing its mobility, survivability, and reliability. It is also considered that, in this instance, there is an increased capability of maneuvering communications channels and insuring the priority of its establishment by the higher command element link in comparison with a normal hierarchal structure (i.e., subordination from below upwards). This system was called NICS.

A special organization--NICSO (NATO Integrated Communications System Organization) directly subordinate to the NATO Council and the Defense Planning Committee and the Construction Management Agency--NICSMA (NATO Integrated Communications System Management Agency), the executive headed by a general director appointed by the NATO General Secretary, were set up to centralize efforts and to achieve unified requirements. The sphere of activities of these organs includes monitoring accomplishment of Defense Planning Committee decisions in the communications and command and control sphere, determination of a general policy on such questions, elaboration of the fundamental trends in NICS development, and direct guidance of its creation, which includes two stages and is to be concluded in the 1980's.

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The elements listed below are envisioned in accordance with the first stage of NICS establishment (until 1980).

--TARE (Telegraph Automatic Relay Equipment), which thanks to computer availability will significantly increase the speed with which information is exchanged. This equipment is planned for installation at 18 large MDC (Message Distribution Centers) set up where the NATO Armed Forces main control stations are located.

--IVSN (Initial Voice Switch Network) consisting of 25 electronic commutators (EK) with built-in memory units and priority logic circuits making it possible to establish instantaneous communications with any command and control link.

-- encryption devices for telephone and telegraph communications which will be installed in the main control stations, army ground forces corps, and the air force and navy elements corresponding to them in order to protect primarily information concerning technical maintenance, storage, and employment of mass destruction weapons. According to foreign press reports encryption devices installed at control stations numbered approximately 300 in 1977 and this is to be increased to 400 by 1980.

--ACE High tropospheric communications system tropospheric and radio relay stations.

--27 ground-based SATCOM satellite communications systems stations of which 22 are fixed and 2 are mobile.

--CAMPS (Computer Associated Message Processing System). It is intended to reduce the time spent in staffs and communications centers in the preparation, accountability, distribution, and delivery of documents. It is considered that this system should be installed in the higher national and NATO staffs.

--Radio relay communications nets.

--Radio communications nets using ultralong, long, short, and ultrashort waves (specifications of several types of equipment used on the communication lines are shown in the table) [table not translated].

Thus, after completion of the first stage, NICS will have: 57 basic communications centers with computers, electronic commutators, the newest channel-forming equipment, and other equipment; 5 continually-operating mobile communications centers for the bloc's highest command element; 7 standby mobile communications centers always in constant combat readiness; 6 TARE stations; 140 territorial tropospheric and radio relay communications mainlines to connect the communications centers; and 38 ground-based satellite and communications satellite monitoring stations.

Figure 2 shows the principles of constructing this system after phase 1 is completed.

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The task for phase 2 (after 1980) involves final connection of all elements into an integrated automated troop command and control support system.

At the present time, according to foreign press data, a significant portion of the plans for the NICS first stage is being completed. It is reported that by mid-1978 TARE sets elaborated using the American electronic commutator AN/TTC-39 as a model were already installed at 6 message distribution centers located with the main control stations. They insure the transmission of information at a speed of up to 9,600 megabits per second with a volume of external storage on magnetic discs exceeding 380 million bits of information. The remaining equipment sets are to be installed at two month intervals until mid-1981. In addition, the plan is to locate 18 IVSN sets at an overall cost of approximately 60 million dollars. The American firm Litton Industries got the contract for their production. The foreign press reports that, in April 1978, installation also began on the electronic commutators for the basic IVSN switch telephone network built by the American firm North Electric. Each electronic commutator can serve from 320 to 1,024 individual and group correspondents. The basis for the commutators are 16-bit processors with three types of storage: operating storage for 64,000 machine words, buffer storage for 16,000, and external storage for 96,000 words. Foreign specialists propose that overall by the end of 1980 25 electronic commutators will be installed, permitting the automated telephone communications to be supplied to 2,000 correspondents in the highest NATO Armed Forces control link, as well as for up to 5,000 correspondents from among the military leadership of bloc participating countries. The intent was to begin work to improve satellite communications subsystems in 1978. Their basic purpose is to support the conversion to digital methods of transmitting data. Therefore, extant ground-based satellite monitoring stations are being modernized.

The plan by the mid-1980's is to complete the conversion to digital transmission methods, to create switching centers with high capacity (in excess of 6,000 correspondents) with electronic commutators, introduce encryption devices at all command and control links, increase the capacity of tropospheric communications mainlines (up to 70-120 telephone channels), and to modernize the satellite communications system. Judging by foreign press reports, the complex of ground-based communications satellite stations and the SATCOM-3B existing at the present time now provide for transmission of more than one-third of the information passing through NICS channels. It is anticipated that the satellite communications subsystem will support up to 50 percent of the information exchange supporting the bloc's highest command element when the second stage of its creation is completed.

It is also noted that the leaders of several West European states are opposed to U.S. desires to impose American-produced equipment as the prototype for the NICS system since they consider that this could lead to unrestricted strengthening of U.S. influence on the development of policy in the field of command, control, and communications within the frameworks of the NATO bloc.

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COMMENTS ON EMPLOYING E-3A AIRCRAFT IN WESTERN EUROPE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 3, Mar 79 signed to press 7 Mar 79 pp 54-55

[Article by Col V. Kondrat'yev: "Plans to Base E-3A Aircraft in Western Europe"]

[Text] An important role in the plans of the aggressive NATO bloc falls to the AWACS [Airborne Warning and Control System], aboard E-3A aircraft built in the United States. The Pentagon developed a proposal to deploy this system to Western Europe and distribute the costs to purchase 18 such aircraft among the bloc member countries (see photo) [photo not reproduced].

Based on data published in the foreign press, the E-3A has the following basic specifications: maximum take-off weight of approximately 147 tons, cruising speed of 670 km per hour (at an altitude of 9,150 meters), practical ceiling of 13,400 meters, loiter time above the airfield of 11.5 hours without air refueling, and a loiter time of 8 and 6 hours, respectively in areas 960 and 1,600 km from the airfield. Its radar can detect airborne targets at ranges up to 450 km when flying at high altitudes and up to 320 km at low altitudes. The on-board equipment permits vectoring of fighter interceptors simultaneously to 15 airborne targets. The aircraft crew is 17 (of which 13 are AWACS equipment specialists).

The possibility of employing these aircraft during peacetime to conduct reconnaissance of the air space and terrain of those fraternal socialist countries sharing the borders with the NATO governments is not ruled out.

The proposal is to use Taverne Airfield as the main base for the E-3A aircraft and ground-based maintenance facilities. This selection is explained by the airfield's location near AFCENT [Allied Forces Central Europe] headquarters (Brunssum, Netherlands), as well as by the availability of space initially intended to house the AAFCE [Allied Air Forces Central Europe] staff. However, at the present time the decision was made to leave this staff at Ramstein Air Base (FRG) since the AAFCE commander, American Gen Evans, is

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simultaneously CINCUSAFE [Commander in Chief U.S. Air Forces in Europe], whose staff is also based at Ramstein, and to transfer the new spaces in Brunssum to the services responsible for E-3A maintenance and combat employment.

Several forward bases are intended to augment the main base for these aircraft. NATO specialists consider that, from the tactical point of view, it is advisable to base the majority of them on the bloc's southern flank (the territory of Turkey, Greece, Italy, and Portugal) and one in Norway.

At the same time the question of employment of one airfield in the Azores as a forward base for an E-3A unit is being examined so that, if necessary, they can accomplish the missions of long-range radar detection of targets and fighter control in the western Atlantic in support of SACLANT [Supreme Allied Commander Atlantic] and SACEUR [Supreme Allied Commander Europe].

The foreign press notes that the forward bases will be intended only for refueling aircraft, changing crews, and provision of minimal technical maintenance and minor repair. The forward bases are not tasked with maintenance and repair of on-board radioelectronic equipment. According to American specialists the equipment is so constructed that crew members can maintain it for extended periods in working condition since all required basic spares will be located aboard the aircraft. Therefore, NATO representatives consider that any civilian airfields capable of accepting and servicing Boeing 707 passenger aircraft can serve as forward bases for the E-3A.

Based on reports from overseas, the main problem facing the higher leadership of NATO bloc participating countries is the high cost of the E-3A aircraft (approximately 1.9 billion dollars), as well as the great expenditures involved with their operation over an extended time (estimated service time for the aircraft is 20 years).

Great Britain is not participating in the purchase of the E-3A and support expenditures since it is developing the Nimrod AEW 2, its own long-range radar detection and control aircraft. It plans to build and employ 11 such aircraft to support NATO and their approximate cost is 450 million dollars.

According to the foreign press, after extended negotiations about sharing the cost for purchase, E-3A maintenance, and participation in production of the electronic equipment, 11 bloc member countries in December 1978 overall approved a program for deployment of AWACS and the expenditures associated with it.

In accordance with the plans of NATO military leadership, the first E-3A will enter the bloc inventory in Europe in 1982. Foreign military specialists consider that deployment of AWACS in Western Europe will considerably increase the survivability of tactical aviation command and control organs in the TVD [theater of military operations].

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COMMENTS ON AIRCRAFT CARRIER TAKEOFF AND LANDING PROCEDURES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 3, Mar 79 signed to press 7 Mar 79 pp 59-63

[Article by Col M. Panin: "Carrier Air Operations"]

[Text] Aircraft carriers are a vital means of imperialistic circles to accomplish aggression and expansion in wartime, as well as for a show of force in peacetime. As the foreign press notes, thanks to their high mobility they can support rapid employment of carrier-based aviation in any area of the World Ocean. However, accomplishment of the missions with which they are tasked to a significant degree will depend upon the professional training of the flying personnel and their skills and ability to fly from the ship's deck. Foreign military specialists underscore that these flights have characteristic special features inherent only of carrier aviation. An aircraft carrier is a mobile airfield with all the requisite means of supporting deck aircraft and helicopters of various types. It does not have a constant aircraft takeoff and landing direction and is subject to rolling. The dimensions of its flight deck, hangars, aircraft elevators, and other support spaces exert a special influence on the organization of siting, repair, preparations, and accomplishment of flights.

The commander of the aviation department controls carrier aviation flights (in a radius of 5-6 km), the air traffic control center (TsUVD--ATCC in a radius of 90-100 km), and the combat information center (BITs--CIC, in a radius exceeding 100 km).

Carrier takeoffs are made with the help of catapults which propel the vehicle at a speed of 260-300 km per hour within two seconds. This speed allows the aircraft to take off practically speaking while the carrier is underway at any wind speeds. Modern American aircraft carriers are equipped with four steam catapults capable during the daytime to sequentially launch aircraft at 15-second intervals.

The most complex and important stage of the flight, according to foreign press information, is the landing approach and the landing of the aircraft on the deck.

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Landing safety is insured using special technical means (automatic and light-assisted landing systems and a television monitoring system) as well as by an officer who visually monitors the landing.

The automatic landing system is used in bad weather. The approach (from a distance of 8-14 km) and the landing are accomplished with its help in the following modes: automatic, semiautomatic, (piloting using the system indicator), and manual (from commands given by the landing radar operator). The basis of the system (it includes a shipboard and an aircraft set) are the AN/SPN-10 shipboard landing radar and the -42 air traffic control radar.

Landings in good weather are done visually using the light-assisted system. It is installed on a stabilized platform (Figure 1) [figures in this article not reproduced] extending beyond the port side of the aircraft carrier. The optical unit is the main portion of the system and consists of five lens sections located one above the other in the platform center. The three middle sections emit a constant yellow light which is converted by a special device into a single yellow beam directed along the glide path (at an angle of 3.5-4 degrees). Above these sections is a constant white light and a blinking red light is positioned below. Horizontal blinking landing permission lights (two each) and vertical wave-off red lights (five each) are located on both sides of the optical unit. Right and left of the latter on the same level with the central section of the optical unit are six constant green so-called reference lights. When the aircraft on the landing approach is within the glide path beam, the pilot sees the yellow and reference green lights. Maintaining them on the same level permits an accurate landing on the carrier (the third arresting cable will be engaged). If the aircraft is above the glide path, the yellow light will be above the reference lights, and if he is below the glide path, it will be below the reference lights. In these instances, the aircraft landing hook will engage the fourth or first (second) arresting cable. If the pilot observes a white steady or red blinking light above or below the reference lights, this means that he must go around again. The lights are visible during the day from 1.5-2 km and from 3-4 km at night.

The landing television monitoring system is an important element in aircraft flight safety. It consists of four television cameras located in various positions on the flight deck and provides the air boss with the capability to additionally monitor the landing and record it on video tape.

At the final stage of the landing approach when the aircraft is following the glide path beam, the wave-off officer assists in forestalling possible pilot errors.

As the foreign press reports, aircraft returning from a mission in bad weather are assigned a waiting zone in which they fly in a circle at assigned altitudes (average duration six minutes), crossing a control point each time (Figure 2).

At the estimated time or upon the command of the ATCC, pilots begin a descent at an interval of one minute. Flight direction to the carrier is controlled

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here using the TACAN system. Aircraft indicated air speed is 460 km per hour and descent speed ( $V_b$ ) is 20 meters per second. Descent speed at 1,500 meters is reduced to 10 meters per second. At 18 km out (this is referred to as the "10-mile gate") at 300 meters the pilot flies level and maintains 270 km per hour so that he can extend the gear, flaps, and landing hook as he passes over the 10 km line (the "6-mile gate").

Passing the "6-mile gate," the aircraft descends to 180 meters and uses the automatic system to maintain the landing course. The landing is made in accordance with the set mode. If the pilot upon the approach to the carrier see the light-assisted system, then he turns off the automated system and executes the landing visually using this system.

Western military specialists note that aircraft landings in good weather significantly differ from landings in bad weather. In the first instance, the pilot notes the carrier or its lights visually from a great distance. As a rule, the aircraft groups are not assigned a waiting zone. In direct proximity to the carrier on a course parallel to the carrier's direction of movement, the aircraft disperse and fly a box landing pattern (Figure 3). The commander of the aviation department controls the pattern during the day-time and the ATCC does so at night.

Here flight altitude during the day is 180 meters and is 360 meters at night at a flight speed of 270 km per hour. The greatest distance from the carrier is 6-7 km and a left box pattern is employed.

Box patterns make up a significant portion of planned flights during combat training missions. Landing rates during these flights are quite high and, for example, reached 45 landings per hour aboard "Enterprise."

Arresting cables and emergency barriers (in the event of an emergency landing) are used as aircraft are landing on the carrier. The arresting gear is a device which brakes and stops an aircraft landing on deck at the speed of 200-250 km per hour (braking time is 2.5-3 seconds, landing roll 90 meters). It consists of three or four interconnected above- and below-deck cables, a system of pulleys, motors, drums, and hydraulic shock absorbers. The above-deck cable (36 meters long) attached to mounts is stretched at right angles to the angular landing deck in the area where the landing aircraft's gear touches down. The cable mounts are raised 10-15 cm above the deck. The above-deck cable (600 meters) is wound by a motor onto a drum and connected with a shock absorber. When the aircraft landing hook engages the arresting cable, the cable is stretched out, a plunger moves forward into the hydraulic cylinder, it extrudes brake fluid, and the aircraft's speed is dampened.

An emergency barrier consisting of a nylon net stretched between two metal stanchions (in normal position they are folded down even with the deck), as well as a steel cable extending across the lower portion of the net and similar to an arresting barrier in design serves to stop an aircraft making an emergency landing. The arresting barrier functions in the following way. The aircraft making the emergency landing strikes the net and its gear struts are entangled in the raised cable, which also brakes and then stops the aircraft.



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An emergency rescue helicopter supports carrier aviation flying. During the flights the helicopter hovers over the port side near the carrier's "island."

These are some of the special features of carrier aircraft flying operations.

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#### COMMENTS ON NATO STUDY OF THE WORLD OCEAN

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 3, Mar 79 signed to press 7 Mar 79 pp 64-66

[Article by Capt 1st Rank (Ret) Ye. Kalayev: "NATO Study of the World Ocean"]

[Text] Stepping up the preparation of naval forces for war, the military-political leadership of the aggressive NATO bloc places special significance on studying the World Ocean.

As the foreign press reports, basic efforts in oceanographic research conducted in accordance with both national as well as joint (international) programs are directed towards insuring the effective combat employment of modern and perspective naval weapons systems (ballistic and cruise missiles, rocket-assisted torpedoes and torpedoes, aircraft, helicopters, and others), conducting ASW and minesweeping, and the navigational safety of ships and vessels.

Special attention is devoted to the improvement and development of long-range submarine detection systems. For this purpose a complex of research is underway in the regions of ASW barriers directed towards elaboration of an acoustic model of the ocean and creation of a system for operational forecasting of the state of the water medium.

Noted in the foreign press is a continual growth in NATO nation participation and integrated research of the ocean carried out by multipurpose scientific research vessels in regions most important in the military sense.

The command element of the NATO navies also places serious attention on the quantitative and qualitative development of oceanographic equipment, as the large volume of appropriations testifies. Between 1972-1977 the United States spent up to 34 percent of its total amount of capital investments for oceanographic programs and other NATO countries spent 21-23 percent for its creation and improvement.

The coincident interests of the largest firms in the military-industrial complex and oil monopolies of the NATO countries to a significant degree facilitate the increase in the rates of development of means for studying the ocean and

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expansion of the volume of research. Thus, an independent sector of industry--"ocean engineering"--specializing in the elaboration of equipment for various scientific research vessels, ships, earth satellites, underwater devices, and so on has already been set up in the United States.

Judging by foreign press materials, the NATO navy command element attaches a special role to organizational and technical measures to coordinate the activities of scientific military and civilian institutions of these countries in oceanography.

Among the aforementioned measures is the creation in 1959 of the NATO ASW Research Center, which was converted in 1959 into the Oceanographic Subcommittee. The subcommittee was reorganized in 1973 into two central directorates (on maritime research and on questions of the interaction of the ocean and the atmosphere).

The activities of the NATO ASW Research Center in the city of Bartolomey (several km south of Spezia, Italy) are directed towards solution of the problems of preparing the most effective oceanographic support for the combat employment of NATO naval resources in the battle against modern submarines.\*

The NATO central directorates on maritime research and on questions of the interaction of the ocean and the atmosphere insure cooperation of NATO nation scientific organizations on the following questions: creation based on national and joint projects of the most improved oceanographic instruments and elaboration of methods of oceanographic research; training of oceanographic specialists and the exchange of specialists between NATO countries for the purpose of improving their qualifications; organization of conferences to examine various problems in the field of oceanography.

In particular, specialized commissions from these directorates accomplished financial cooperation in the organization of several conferences, including on problems on studying the North Sea (1971), modeling maritime systems (1973) and the study of the bottom boundary layer (1974), in elaboration of current recordings (Norway) and of mathematical models of individual ocean regions (FRG), in work involving a joint project to create supersensitive laser measurement of currents based upon the Doppler principle (Norway, Belgium, Great Britain), organization and conduct of a number of international full-scale experiments using several scientific research vessels and maritime buoy stations for the purpose of studying the processes of the microinteraction and structure of the ocean's upper layer, and in organization of two-year courses for oceanographic specialists from NATO countries.

Also, the aforementioned commissions subsidize the joint study of wind generation in the North Sea and work done by Hamburg University in the area of researching the interaction between the ocean and the atmosphere. In the opinion of foreign naval specialists, extant data, including patented materials and reviews of reports from annual conferences on ocean engineering, testify to the sufficiently high scientific and technical level of the development in ways to study the seas

\* For details on the NATO ASW Research Center, see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 8, 1977, pp 71-73--Ed.

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and oceans in the main NATO countries, especially the United States, Great Britain, the FRG, and Canada. These countries meanwhile are placing increased attention on the development on automated ways to collect and process oceanographic information, automated cartographic systems, and gravimetric and other research equipment. As the foreign press notes, at the present time such automated systems for collecting and processing oceanographic information as "Autocarto," "Magnaplot," and "Hydas" (United States), "Polarplot" (Great Britain), "HOPS" (Canada), "Oceanolog" (The Netherlands), and so on have found wide practical use. For example, the "Hydas" system has already become the standard and is being installed on all U.S. Navy scientific research vessels.

An automated cartographic system went into operation in the U.S. in 1977. It is functioning in the Hydrographic Center of the Defense Mapping Agency. Analogous systems now at the stage of experimental use have also been created in Great Britain and Canada.

The NATO countries are doing a great deal of work to create and improve remote systems for studying the World Ocean, including geophysical (oceanographic) artificial earth satellites, buoy stations, underwater research devices, and so on. Recent research done in the U.S. demonstrated the high effectiveness and economy of use of space-based devices for collecting oceanographic information. According to Western press information, the U.S. in 1978 planned to launch the SEASAT-A artificial earth satellite intended to collect navigational and oceanographic information. It was equipped with a device to measure the temperature of the ocean's surface, wave heights, wind speed, and geophysical parameters (a radiometer operating in the scan mode, an IR radiometer, a scatterometer, a short-pulse radar altimeter, a radar with a synthesized aperture, and so on).

The navies of the leading NATO countries are stepping up development of underwater means for studying the ocean, placing special attention on creation of manned and primarily unmanned multipurpose and specialized underwater equipment.

In the opinion of foreign military specialists, a high level of development and series production of gravimetric equipment and devices to study the stationary geomagnetic and electrical fields in the World Ocean will be achieved in the U.S., FRG, and Canada. Also, the maritime gravimeters built by the firms Ascania Werke (FRG) and Lacoste Romberg (U.S.) fully meet the requirements placed upon them.

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COMMENTS ON EQUIPMENT FOR U.S. FROGMEN

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 3, Mar 79 signed to press 7 Mar 79 pp 66-72

[Article by Capt 2d Rank V. Mosalev: "Frogmen Underwater Equipment and Delivery Systems"]

[Excerpts] U.S. Navy intelligence and diversionary subunits [podrazdeleniye], which will be assigned an important role in the accomplishment of imperialistic aggressive designs, are being manned by personnel (frogmen) who have undergone special training on carrying out reconnaissance in the enemy rear area and in diversionary and subversive activities.

Depending upon missions assigned, a frogman's equipment includes: a breathing device, wet suit, mask, flippers, individual rescue gear, depth meter, underwater compass and watch, flashlight, as well as means for hydroacoustic, underwater sound, and VHF communications, underwater weapons, and explosives.

In order to move significant distances frogmen use various underwater means of locomotion and inflatable boats with attached motors and oars. Frogmen are delivered to the enemy shore in special high-speed boats, helicopters, aircraft, submarines, and landing craft.

Breathing devices permit extended stays underwater. They are divided into devices with closed, semi-closed, and open breathing cycles depending on how the breathing mixture content is regulated.

The first category uses compressed air which is exhaled into the water. They permit remaining underwater for a limited time and at shallow depths (down to 40 meters), provide limited autonomy, and the bubbles of air give the position of the frogmen away. At the present time they are used by EOD personnel deactivating ammunition and for training frogmen.

The second type of device uses an artificial breathing mixture--an inert gas with a reduced oxygen content. It permits diving to a depth of 250 meters. As the frogman dives only oxygen is expended and the excess inert gas is

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periodically bled off into the water, while the carbon dioxide is removed by a chemical absorber. The expenditure of the breathing mixture is less than that of the first category by a factor of almost 10. The Emerson device when fully charged weighs 11.3 kg, has neutral buoyancy, and permits remaining underwater up to four hours.

The third category uses a breathing mixture formed by mixing oxygen and an inert gas. Pure oxygen in exact accordance with its requirement in the mixture is fed into the breathing tract via a portioned pressure sensor. During the breathing process the inert gas, practically speaking, is not used up, while the carbon dioxide is removed by the chemical absorber. Such devices allow the diver to remain at depths of up to 400 meters for 6-12 hours.

Means of delivery and landing frogmen. Frogmen are delivered to the reconnaissance and diversion area by submarines which, after surfacing, permit them to exit via the torpedo tubes and special chambers. In order to land and take aboard frogmen located in the bow portion of the former missile submarine "Greybeak" two missile tubes were converted into locks. They can each house two four-place "Truss" open underwater locomotion devices (Figure 5) [figures in this article not reproduced], while the boat can accommodate 67 frogmen. Spaces have been allocated aboard "Gudgeon" and "Sealion" submarines to house 100 and 160 frogmen, respectively, and locks have been built so the frogmen can launch en masse while submerged. In addition, "Tunney" and "Purn" [phonetic] submarines have been converted to landing vessels. At the present time all are part of the Navy reserve.

Divers are transported over short distances in underwater delivery systems (PSD) and rafts. The U.S. Navy uses 1-, 2-, and 4-place "wet" PSD, 5-place "dry" PSD, and single-place rafts.

Frogmen in "wet" PSD are protected against the stream of water but are not protected against the outside environment and use breathing devices or are connected into the breathing system on the PSD in order to conserve the breathing mixture in the devices. These PSD transport frogmen for a short time at a maximum speed of eight knots. Frogmen in the "dry" PSD are protected against the outside environment and do not wear their masks aboard since they use the PSD autonomous life support system. The PSD are filled with water so that the frogmen can exit. Such PSD transport the frogmen over great distances for a long time, and at speeds exceeding eight knots. A frogman in a raft is fastened from above with the aid of special clamps and is not protected from the oncoming stream of water. The basic specifications for "wet" PSD and rafts are shown in the table [table not reproduced].

PSD and rafts are equipped with magnetic and gyroscopic compasses and with instrumentation--gyrohorizon, depth meter, log, tachometer, watch, indicator of water entering the hull, and also can be equipped with underwater movie and still cameras with lights. A PSD has a small AN/WQS-1 sonar (range 450 m, operating frequency 200 KHz).

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Frogmen are delivered and picked up from the surface of the water by special small, medium, and heavy support boats, as well as by LCSR quiet fast boats (speed 34 knots, range 150 miles, accommodating 20 full-equipped men). The boat is equipped with a special system for dropping off and picking up frogmen while moving and has a radar, AN/SLR-21 RHAW gear, identification system, and depth finder.

Frogmen are landed on the shore using Gemini inflatable boats with a quiet Zodiac motor and with oars. This is to be replaced by the Mars boat made of a new very strong and light material.

At the present time, as the foreign press reports, tests are underway on the JEFF (B) air-cushioned landing boat. It weighs 102 tons, has a lifting capacity of 60 tons, a speed of 50 knots for four hours at a sea state of two balls, and is seaworthy of up to five balls. In the opinion of foreign specialists it would be used to land frogmen. All landing ships having a well can deliver the boat to the enemy shore.

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